

treated it seems we might disregard the remote danger of sudden protein shock and the discomfort of the serum sickness. The only cases where they have to be really considered are in adults, and especially those giving a history of asthma or other protein hypersensitiveness. A final point to which I might refer is that all serums and antitoxins gradually lose potency on standing. This deterioration is less rapid if they are kept in a cold place and in the dark; but speaking of this city only, one has only to

visit 2 or 3 of the larger drug stores at random and ask for some serum to see how these precautions are neglected; and I think it is not too much to say that most of the serums purchased indiscriminately at drug stores are practically inert. It seems unfortunate that there is no system in this province for the provision of serum for indigent cases, as is done almost universally elsewhere on the continent, and also for an official inspection of the product as usually supplied.

Clinical Lecture on LEAD NEUROPATHY

A. H. GORDON, M.D.

Assistant Professor of Medicine, McGill University, Montreal

Physician to the Montreal General Hospital

THOUGH poisoning by lead is perhaps not as common as it used to be, as a result of the improvements in industrial methods, it is yet far from rare, and is by no means a clinical curiosity, and it is more on account of certain unusual side issues and the diagnostic lessons which they teach, that this case is brought before you to-day.

The history, shorn of inconsequent details is something as follows: This young man of twenty-eight is a farmer, a married man without children, living some miles from a small town a distance from Montreal. He was brought to the hospital on a stretcher and complained of general weakness and loss of weight, of paralysis of both arms, and of double vision.

For several years he had been subject to attacks of painful "indigestion" and was operated upon three years ago for chronic appendicitis, and two years ago for gall bladder disease. He states that following each operation his pain was better for a time after leaving the hospital, but again returned, and during the past summer and autumn it has been so bad that on several occasions he called a physician who gave him morphia under the skin. Though reduced in weight and strength he kept at work until three weeks ago. At that time he was driving, and his horse bolted, and he had difficulty in pulling him in, and following this he developed weakness in both

arms which rapidly became extreme, and for the last few days his arms and hands have been almost powerless, so much so that he has been unable to feed himself. There is also slight pain and some stiffness and awkwardness. His general strength is much impaired and he has lost greatly in weight. He is only able to stand with help and walks with difficulty. Lately he has been seeing double, but his vision is otherwise good. He neither smokes nor drinks and has no venereal history. The other details of his personal and family history are irrelevant. His temperature is 98.2, his pulse 96 and his respirations 24. You will notice his sallow colour, and the paleness of his mucous membranes and finger nails, and the general appearance of moderate emaciation which he presents.

We will reverse the usual order and have you look first at these arms and hands which lie supine and flaccid on the clothes. When the bed is turned around you can see the marked atrophy of both the supraspinatus and infraspinatus muscles, the trapezius and the rhomboids, and from the front the wasting of the pectorals, and these all show a well marked weakness. The deltoids too are flat and raise the arms with difficulty. The biceps is weak but not powerless, but the triceps on both sides shows the greatest weakness of all, while the supinator longus shows

no apparent weakness when he attempts to flex the forearm while it is midway between pronation and supination. The extensors of the wrist are extremely weak—he is unable to raise the unopposed hand. The grasp of the hand is very feeble while the palmar and interossei muscles show marked atrophy.

Let us look now at the legs. The iliopsoas muscles show some weakness and so do the flexors and extensors of the legs and feet but in no case does it amount to paresis, in marked contrast to the condition of the upper extremities. The knee jerks are present, the plantar reflex is feeble in flexion, and the abdominal reflex is active, while the triceps and radial reflexes and the deltoid and pectoral responses are all very feeble. The organic reflexes are all preserved.

Both hands when lifted show a distinct rather coarse tremor, and the tongue is also tremulous. The pupils are even and active, and there is no diplopia to-day, though the patient is very positive that it existed, and states that one image was above the other. The ocular fundi show a well marked neuroretinitis.

I have shown you these features of his nervous system first to emphasize the condition which has brought him to the hospital. He has a practically pure lower motor neurone involvement affecting chiefly his upper limbs.

Now let us return to the routine examination. Looking at his mouth you will see that several teeth have been removed, they were said to have been infected; the remaining front teeth are good, well kept, and show nothing of importance, but looking farther back we find above the left upper bicuspid and first molar a dark line in the gum; fragmentary lines are also seen over two of the right lower back teeth, and over a right upper molar. Examined with a lens these lines are definitely stippled and are undoubtedly in the substance of the gum.

Examination of the thoracic and abdominal organs gives only two positive findings; an accentuation of the aortic second sound and a faint trace of albumin in the urine. The Wassermann reaction is negative.

The blood examination shows 3,680,000 red cells, 5,600 white cells, haemoglobin 62%, polymorphs 71%, mononuclears large and small 27%, mast cells 1% and eosinophiles 1%. The red cells show marked pallor with alterations in size and shape, and there are numerous stippled red cells (basophilic granulation) often four and five to an oil immersion field. By a curious accident

the first smear made showed no stippled cells, and thereby hangs a tale.

The patient's wife had accompanied him to the hospital, and after the first suspicion of lead poisoning had been raised by the few dark lines above his back teeth, he was questioned as to a possible source of poisoning, when he stated that he had not been using paint or lead in any form, but on inquiry being made concerning his water supply he stated that for years it had come from the present source, a small spring which had been boxed, and piped for eighty rods to the kitchen of his house by a lead pipe which was connected with a constantly running tap. This spring went through a hollow in the land which left a concavity or belly in its length and during dry periods the water ran slowly and had a longer stay in the concavity. Such a dry spell had recently occurred.

The case for lead poisoning being thus far only a well-grounded suspicion, with at that time no proof in the blood, and an imperfect line on the gums, we had recourse to the old method employed in the diagnosis of venereal disease—"confrontation."

If the water supply was at fault the patient's wife should also show signs of lead poisoning. Her mouth, less perfectly kept, showed an unmistakable lead line above every tooth, and on inquiry she admitted also a painful "indigestion" for which she had been treated. These findings, joined with the patient's condition seemed sufficient for a diagnosis of lead poisoning; every succeeding blood smear of the patient showed many stippled cells.

It is not necessary to emphasize the usual method of contracting lead poisoning in the manufacture and employment of lead in the various industries. A worker in a lead or paint factory, a painter, or a maker of batteries is always under suspicion—"a man is known by the company he keeps,"—but a farmer of all men might reasonably avoid such a suspicion, and so I might remind you of some of the more unusual modes of contamination.

Two years ago a man entered our service with lead poisoning. His history was that he had diarrhoea and had received a prescription for lead and opium pills, and finding them useful he had the prescription repeated a number of times until he had taken three or four dozen, when he appeared with colic and a very definite lead line on his gums.

You may also recall the case reported by Dr

W. F. Hamilton, of several instances of lead encephalopathy in one family following the burning for fuel broken boxes in which white lead had been contained; and again, the very interesting group of cases which occurred one summer and were reported by Dr. H. B. Cushing, in which lead poisoning developed among owners of small soda water fountains. He found that they had drunk their own beverage after the carbonated water had been undisturbed for some hours in the lead container. Then there are the instances of poisoning from pickles kept in vessels lined with lead glaze; not to mention instances in which hair dye, face powder and such other resources of civilization contained the poison.

These points thus emerge as lessons from this case:

1.—The sudden appearance of paralytic manifestations as a result of stress (pulling up a runaway horse) in a man probably long a subject of lead poisoning.

2.—The unusual type of the paralysis—shoulder girdle and arm.

3.—Contamination from a water supply in use for years.

4.—Confirming of the diagnosis by "Confrontation."

5.—The light thus thrown upon the patient's previous abdominal complaints.

THE INFLUENCE OF INFECTION UPON THE REACTION OF THE DIABETIC TO INSULIN TREATMENT*

I. M. RABINOWITCH, M.D.

Montreal

THE object of this communication is to record the types of "blood sugar time curves" obtained from patients suffering from diabetes mellitus, complicated by gangrene and infection, which demonstrate the influence of the latter upon the reaction of such individuals to insulin treatment.

It is generally recognized that infection is an important factor influencing the mortality statistics of diabetes mellitus. The statistical data of this hospital, recorded briefly below, may be used to demonstrate this point.

Total number of diabetics treated from April, 1920 to April, 1924—412.

Total number of deaths, 25 or 6.06%.

Causes of death:

Coma	10 or 2.42%
Infection	9 or 2.12%
Cerebral Haemorrhage	2
Pulmonary "	2
Inanition "	2

It will be noted that infection accounted for approximately the same number of deaths as did coma. If the data are divided as obtained

from two periods—before and after the advent of insulin treatment—the influence of infection upon the mortality rate is still more strikingly demonstrated. Since insulin was first employed 196 patients have been treated for diabetes (including those with and without insulin). Amongst these the total number of deaths was 4. Thus insulin has reduced the mortality rate in this hospital to approximately two per cent. All of these four patients died of a septicaemia. In only one could there be demonstrated, from the laboratory view point, an acidosis of a sufficient degree to cause death from diabetic coma. No uncomplicated case of diabetic coma has as yet failed to respond to insulin treatment.

The "blood sugar time curves" obtained following the administration of insulin in the cases of diabetes mellitus complicated by infection presented one phenomenon in common; namely, the absence of the characteristic rapid onset and steep nature of the fall of the blood sugar. Various types of curves have been noted. In isolated instances with septicaemia and severe acidosis only the slightest changes were noted in spite of the enormous doses of insulin (100 units) administered. Thus:

*From the Department of Metabolism, Montreal General Hospital.